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Hans-Martin Wiedenmann

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EXAMINER

SALZMAN, KOURTNEY R

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/510,397	Applicant(s) WIEDENMANN ET AL.	
	Examiner KOURTNEY R. SALZMAN	Art Unit 1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Summary

1. The arguments filed September 14, 2010 have been considered.
2. The 35 USC 112 rejection of the terminology "post injection" has been withdrawn in light of the arguments.
3. Applicant has been invited to submit or file any information which can clear up any other inaccurate translations from their PCT application if necessary in order to ensure their true invention is represented in their specification and claims.
4. Claims 8-22 are currently pending and have been fully considered.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 21 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 21 does not ever expressly discuss short term lean operation or the operation of the reversal of polarity during this condition. It is continually taught for the reversal to occur during lean operation yet the requirement of the sensor to be in short term lean conditions is not discussed. Moreover, this is not supported by the independent claim as this claim only requires the reversal of the

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polarity throughout the duration of a post fuel injection. It is the interpretation of the examiner for the time post fuel injection to not just be a short term condition and is therefore not otherwise discussed.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. The term "short term lean operation" in claim 21 is a relative term which renders the claim indefinite. The term "short term" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Since there is no long term comparative value in the specification or other claims or any other discussion of short term or its complementary pieces, the length of a short term is relative, indefinite and overall ambiguous.

Claim Rejections - 35 USC § 103

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. Claims 8-22 are rejected under 35 U.S.C. 103(a) as being obvious over LENFERS et al (DE 198 38 466, rejections are based on US 6301951 as the English equivalent to this document) and CARNAHAN et al (US 3,768,259).

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Regarding the preamble of claim 8, LENFERS et al teaches an oxygen sensor in an exhaust engine, as stated in the abstract. LENFERS et al teaches in the only figure a Nernst cell (12) with a measurement electrode (16) and reference electrode (18) contained in the reference canal (30). The pump cell (14) has an outer electrode (40) and inner electrode (38) separated from the exhaust gas by the diffusion barrier (22).

Regarding claim 8 limitations, LENFERS et al teaches the application of voltage to a pump cell in c. 3, l. 40-42 (of the English translation of LENFERS et al).

LENFERS et al states the pump voltage being cathodic or anodic to correspond to the lean or rich range of fuel-air ratio in c. 3, l. 42-45, citing cathodic current during lean operation in c. 3, l. 67 – c. 4, l. 1. This obviously causes anodic current to flow during rich operation. LENFERS et al teaches a rich drift to occur during lean conditions (c. 3, l. 67 – c. 4, l. 9) which is offset by reverse polarity pulses of the pump voltage in c. 4, l. 18-26.

LENFERS et al fails to teach the engine to be in lean operation during time following a fuel injection.

CARNAHAN et al teaches a system or method for controlling engine exhaust comprising the known use of fuel injection during lean operation to maintain a lean range of air-fuel ratio in column 3, lines 33-46.

Because LENFERS teaches that the reverse polarity pulses eliminates polarity on the electrodes during extended periods of lean operation (c. 4, l. 44-47), then it would have been obvious to one possessing ordinary skill in the art at the time the invention was being made to also utilize these pulses during other extended periods of lean operation, such as the following or during the application of a fuel injection to maintain lean operation like shown by CARNAHAN et al, so as to prevent the polarization of the electrodes during these other lean operations as well.

Regarding claim 9, LENFERS et al explains in c. 3, l. 59-67 that while the pump voltage is at a constant amplitude, a timer responds with a signal. The timer controls the pulse width, via the switching means, before reversal of polarity provided. (c. 4, l. 20)

Regarding claim 10, LENFERS et al teaches in column 4, lines 26-32 the time ranges and pulse applications to be dependent on the voltage. Therefore, if the pulse time is set, the voltage would need to vary, to maintain accurate readings.

Regarding claims 11-16, the manipulation of the frequencies are said to be variable in column 4, lines 32-36 of LENFERS et al. Therefore, it would be

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obvious to one of ordinary skill in the art to operate the pulses with a frequency which will best depolarize the electrode, decreasing the rich drift.

Regarding claims 17-19, it would be obvious to one of ordinary skill in the art for the temperature of the engine and in turn the exhaust gases and sensor to increase in temperature following fuel injection as it is well known in the art for a mixture which is too lean to run hotter as it gets leaner. Therefore as the time becomes greater since the last fuel injection and the mixture becomes leaner, the engine will run hotter or increase in temperature.

Regarding claims 20 and 21, LENFERS et al teaches in claims 4 and 6 for the reversal of polarity to occur during predominate anodic currents (rich operation as defined in the above rejection of claim 8) in claim 4 and cathodic currents (lean operation as defined in the above rejection of claim 8) in claim 6. It would be obvious for operation to continue during both operation conditions.

Regarding claim 22, LENFERS teaches that the reverse polarity pulses eliminates polarity on the electrodes during extended periods of lean operation (c. 4, l. 44-47). Since there is no relative definition of short term to clarify, for the purpose of this action, the examiner has interpreted short term to be relative to the length of operation of the vehicle. Therefore, in light of the larger operation,

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the periods of lean operation are short term relative to the length of time the car is operating.

Response to Arguments

12. Applicant's arguments filed September 14, 2010 have been fully considered but they are not persuasive.

a. Applicant argues LENFERS et al and CARNAHAN et al fail to disclose or suggest "providing clocked pump current polarity reversal in post injections, which ultimately no longer correspond to a lean operation from the temporal point of view".

i. There is nothing in the claims which even vaguely refers to any type of clock or counting of time. The usage of a "temporal point of view" in terms of the claims is irrelevant. The claim should not require a certain point of view or perception of the wording but rather a clear interpretation or explanation of the invention. If the intention of the claim is to define short or long term operation in terms of a clock or "temporal point of view", please make that clear in the wording of the claim as opposed to the arguments as these terms are never discussed in the claim.

b. The applicant also argues on page 7 that CARNAHAN et al isn't concerned with the reversal of the polarity and the combination of the two references is hindsight.

ii. This is never the intention of the use of CARNAHAN et al but rather the intention of CARNAHAN et al is to address the condition of the engine

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post injection. CARNAHAN et al is only used to teach that post injection conditions are lean. The reversal of polarity in lean operation is taught by LENFERS et al. It is unclear how a process performed in lean conditions in view of evidence of the condition of the engine post injection to be lean would be hindsight. The post injection lean operation is a condition which occurs in practice and CARNAHAN et al is simply providing written record to this, no hindsight necessary.

iii. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

c. Applicant also states on page 7 that "the sensor possibly regenerates automatically in the cited references due to the changed mixture in the cavity" and polarity reversal wouldn't be required post injection.

iv. This statement is not clear. The mixture of fuel and air is constantly changing in every engine as long as the engine is operating and fuel is combusted. Regarding the regeneration, firstly the possibility of

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regeneration acknowledges this is not necessary. Secondly, it is unclear where the discussion of regeneration in terms of cavity mixture is in the references.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KOURTNEY R. SALZMAN whose telephone number is (571)270-5117. The examiner can normally be reached on Monday to Thursday 6:30AM-5PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

krs

11/18/2010